

DOCUMENT-IDENTIFIER: US 4038101 A

**\*\* See image for Certificate of Correction \*\***

TITLE: Reactive pigments and methods of producing the same

Detailed Description Text (10):

Colorless dyes which develop intense colors immediately upon contact with Bronsted acid-and/or Lewis acid-type substrates. The color development is influenced by environmental pH and/or polarization of the dye. Examples of type I dyes are crystal violet lactone and other triarylmethane dyes, such as malachite green lactone. Michler's ketone and Michler's hydrol as well as other diphenylmethanes are also examples of type I dyes.

DOCUMENT-IDENTIFIER: US 4407960 A

**\*\* See image for Certificate of Correction \*\***

TITLE: Visual chemical indicating composition for monitoring sterilization

Brief Summary Text (19):

Thus a leuco base form and Michler's hydrol (which is termed an intermediate in a dye synthesis) are precursors in the formation of triarylmethane dyes. With the exception of the leuco base, crystal violet lactone, which has been used in the production of a new kind of carbonless copy paper, these precursors have not obtained end uses.

Brief Summary Text (23):

The indicating composition of this invention comprises a selected precursor or analog thereof of a triarylmethane dye, and an acidic constituent. The precursor and acidic constituent react to produce a color (e.g. blue) which upon exposure to ethylene oxide under sterilization conditions will change to essentially colorless. Triarylmethane precursors effective for use as color change indicators herein are selected from the leuco base forms and dye-synthesis intermediates, and include: Michler's hydrol (4,4'-bis[dimethylamino]benzhydrol), Michler's hydrol leucobenzotriazole, Michler's hydrol leucomorpholine, Michler's hydrol leucobenzenesulfonamide, malachite green leuco, rhodamine lactam, crystal violet lactone, and crystal violet leuco.

Detailed Description Text (3):

The precursor leuco base-forms and the benzhydrol intermediates, (such as Michler's hydrol) from which the dye radical is derived, are non-resonating forms and therefore non-color producing. A leuco base precursor has a central saturated carbon atom, as does the intermediate, Michler's hydrol. The precursors herein used may be considered to be alkylated precursors of the triarylmethane dyes. The selected groups of leuco base and intermediates (also herein referred to as precursors) chosen for use in the indicating composition of the present invention include:

Detailed Description Text (41):

Michler's hydrol leucomorpholine, Michler's hydrol leucobenzenesulfonamide, and Michler's hydrol benzotriazole are leuco base precursors of the triarylmethane dyes which are derivatives of Michler's hydrol.

Detailed Description Text (53):

The aforescribed triarylmethane dye precursors comprising the leuco base forms and Michler's hydrol intermediates have been shown to be effective for use as visual chemical indicators for ethylene oxide within the parameters and conditions set forth above. It is reasonable to conclude that analogs of the Michler's hydrol intermediates such as ethyl hydrol will react substantially the same as the methyl hydrol (Michler's). A unique end use has thus been presented for these precursors which in the presence of acid are applied as visual chemical indicating compositions for alkylating agents such as ethylene oxide.